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From: Investigating Officer, One-Man Formal Investigation
To: Commandant (G-MOA)
Via: Commander, Thirteenth Coast Guard District (m)

Subj: INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE GROUNDING OF THE MOTOR VESSEL NEW CARISSA, LLOYD'S NUMBER L8716136, OFF COOS BAY, OREGON, ON 04 FEBRUARY 1999, WITH MAJOR POLLUTION AND NO PERSONNEL INJURIES OR LOSS OF LIFE

PRELIMINARY STATEMENT

On 11 February 1999, the Commander, Thirteenth Coast Guard District, pursuant to his authority under 46 USC 6301, convened a One-Man Formal Investigation to examine the events surrounding and cause of the grounding of the M/V NEW CARISSA (L8716136), 2.7 miles north of the entrance of Coos Bay on 04 February 1999.

The Public Hearing was held, from 23 February through 4 March 1999, at Marine Safety Office Portland, Oregon. The board named the following parties in interest: Owners of the NEW CARISSA (TMM Co. LTD); the Coos Bay, Oregon Pilots Association; the local Shipping Agent for the NEW CARISSA (International Shipping); and the Master of the vessel (Captain Benjamin Morgado). Sworn and transcribed testimony was received during the hearing. Documentary evidence was received before, during and after the hearing, and each was formally marked and entered into the official record.

The contents of this report comply with IMO Resolution A.849(20), Code for the Investigation of Marine Casualties and Incidents. The substantially interested states in this investigation are the Republics of Panama and the Philippines.

C. K. LOCKWOOD

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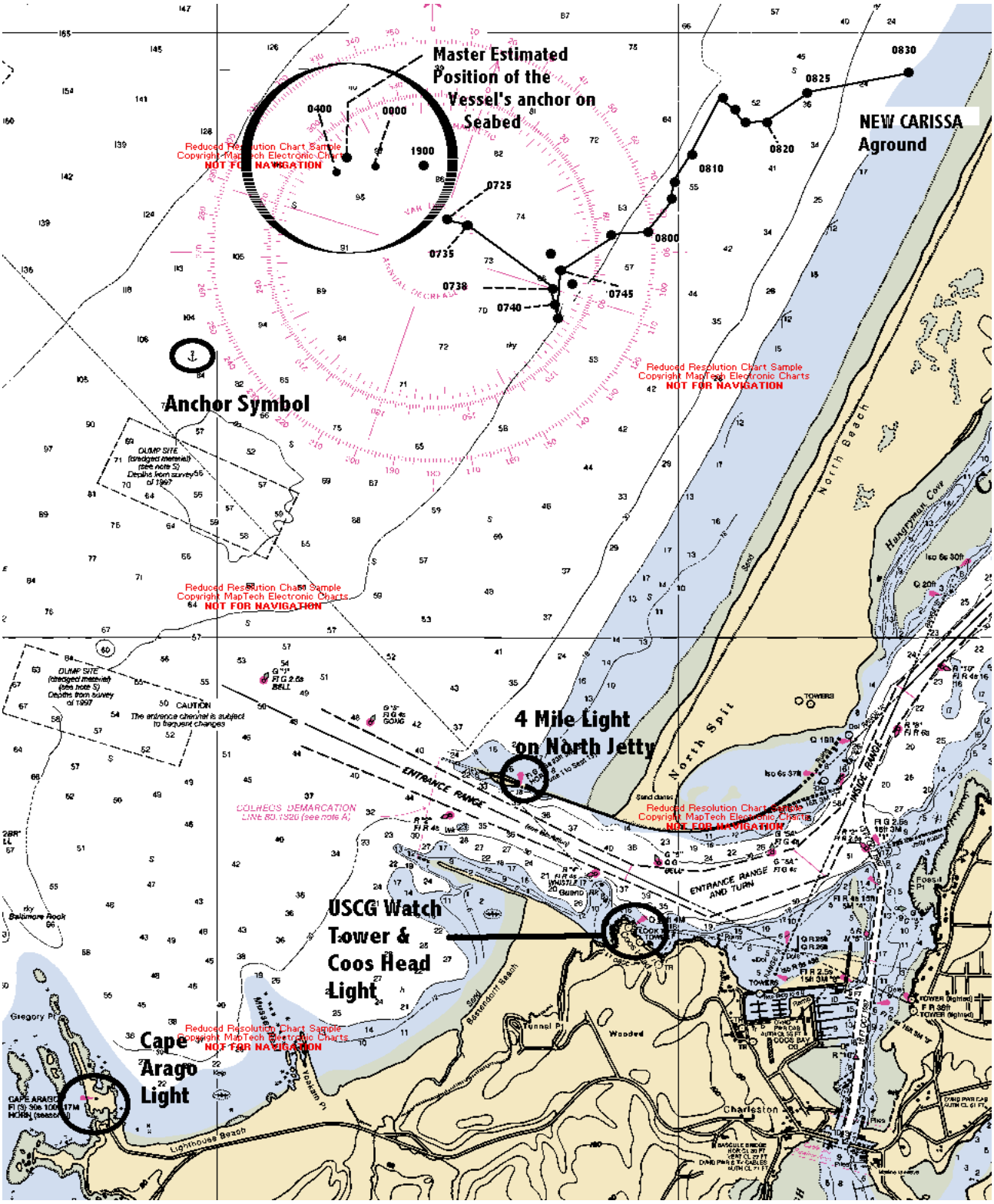


The above graphic is a representation made by the Investigating Officer for the purpose of capturing the information found on the chart used by the NEW CARISSA's deck officers. This graphic is provided to assist the reader in seeing the charted position of the NEW CARISSA from anchor to grounding. Terrestrial reference points useful for area familiarization are circled for easy reference.

FINDINGS OF FACT

I SUMMARY

On 4 February 1999, during an accurately forecasted winter storm, the 639 foot, Panamanian registered, bulk freighter M/V NEW CARISSA ran aground on the shore 2.7 nautical miles north of the entrance to Coos Bay, Oregon.

The grounding was a result of the Master's ill-fated decision to anchor the NEW CARISSA on 3 February, 1.7 NM from shore, in a gale with forecasted weather conditions calling for rising seas. These seas eventually caused the vessel to drag anchor on the morning of 04 February. A contributing factor to this event was the Master's imprudent approach to anchoring. He chose to use only one anchor and did not lay out more anchor chain as would be expected for the environmental situation. Inadequate watch keeping and position taking by the ship's deck officers, in combination with an improperly sized anchor drag circle placed on the navigation chart by the Master, delayed discovery of the ship's unintended movement. Once it was determined the vessel was dragging, the Master attempted to raise the anchor and maneuver offshore. Almost immediately the ship swung and fell into the swell troughs. Because of the heavy strain placed on the anchor windlass by the forces of the sea and wind, as well as the maneuvering actions ordered by the Master, the crew struggled for 45 minutes to get the anchor off the sea floor. During this critical period, the NEW CARISSA was restricted by the dragging anchor, pounding sea waves and swells up to 25 feet, a broadside 22 knot wind, and the vessel's inability to obtain full power from its propeller and rudder as its stern periodically lifted clear of the water. By the time the anchor was raised off the bottom, the ship had been pushed inescapably close to shore, well within the shore breakers. Realizing the inevitable, and with the hope of protecting the ship's rudder and propeller, the Master eventually ordered the ship's bow toward the beach. The NEW CARISSA grounded in the surf line, several hundred yards from the beach bluffs at 0830 in the morning.

The vessel was unable to free herself from the beach, nor was any tug assist available. Over the next several days, the NEW CARISSA gradually worked her way closer to shore, where, on the night of 08 February, she broke into two sections. She carried 359,000 gallons of bunker fuel and 37,400 gallons of diesel, of which, approximately 70,000 gallons was estimated as being released into the environment. In

an effort to mitigate the seemingly impending catastrophic discharge of oil prior to the breakup, incendiary devices were used to ignite the oil in-situ (in place). This proved effective in consuming about 50% of the remaining oil onboard.

The salvage efforts to remove the wreck of the NEW CARISSA's stern section from the beach continue as of the writing of this report. The bow section was removed by a tug on 1 March, but broke free during a severe storm and was driven ashore again on 3 March approximately 110 miles north of Coos Bay, near Waldport, Oregon. It remained there until 11 March, when it was again towed out to sea and ultimately sunk 282 NM off the Oregon Coast in 1800 fathoms of water, in position 43-31.6N, 130-26.6W. A plan to remove and dispose of the stern section has been approved and efforts to this end are ongoing.[1]

II CHRONOLOGY OF EVENTS

3 February 1999

The M/V NEW CARISSA completed a ballast passage from Japan to the coast of Coos Bay, Oregon. At 1700 local time, when approximately 20 NM from the Coos Bay "K" buoy (sea buoy), the Chief Officer contacted the Coos Bay Pilots by VHF radio. He advised the Pilot of the vessel's ETA and was subsequently informed that the weather conditions at Coos Bay would prevent the vessel from entering Coos Bay until the following morning. A second radio conversation occurred approximately one half hour later as the vessel updated its ETA. In response to the Pilot asking about the NEW CARISSA's ballast condition, the Chief Officer reported the ship was carrying full sea ballast, including the number 4 cargo hold. He also relayed that the number 3 wing and number 4 double bottom ballast and the after peak tanks were empty. The vessel's draft was 16 feet 4 inches forward and 25 feet 9 inches aft, resulting in an approximate 9 1/2 foot trim by the stern.

During a later conversation with the Master, the Pilot asked if the remainder of the NEW CARISSA's ballast tanks could be filled before docking. In response, the Master asked the Pilot if filling the ballast tanks would get the vessel into Coos Bay Harbor that evening. The Pilot replied it would not and reemphasized the vessel could not dock until the next morning.

[1] Additional information regarding the response, salvage, and clean-up activities can be found in the Federal On-Scene Coordinators report.

The Master decided to anchor over night to wait for the Pilot. He did not request, nor receive, any advice from the Coos Bay Pilot regarding anchoring. In fact, the Coos Bay Pilot believed the vessel would remain underway until the next morning.

At 1900, the NEW CARISSA, using its port anchor and seven shots of chain (630 feet) eventually anchored in sand in position 43-23.5 N, 124-21.2 W, approximately 1.7 NM off the beach. The wind at this time was from the south-southwest at 31 knots and the swell was approximately 12 feet from the west-southwest, capped by 5 foot wind generated waves. The latest National Weather Service Forecast predicted the winds to moderate overnight with the seas to increase in height.

The Third Officer plotted the ship's position using a single radar bearing and range off the end of the north jetty of the Coos Bay Entrance Channel. Testimony indicated that the north jetty is the best location to obtain a radar line of position. Although each deck officer testified to using the same spot on the jetty to ascertain the ship's position, a review of the NEW CARISSA's navigation chart shows a 150-yard variance in the lines of positions taken along the jetty over the next 13 hours while at anchor and dragging.

The Master placed an anchor drag circle on the chart that was 200 yards larger than it should have been. A drag circle provides a means to readily determine if the ship's anchor is holding properly. The plotted positions of a vessel at anchor should remain within the drag circle, generally near its edge as the ship swings (weathervanes) in relationship to changing wind and swell direction. A radius of drag circle is calculated by adding the length of chain let out (7 shots, 630 feet) to the length of the vessel from the bow to the ship's bridge (approximately 600 feet). In this case, the correct distance for the circle should be about 1230 feet (410 yards). It is not known why a 610 yard circle was drawn on the chart. Surprisingly, none of the deck officers questioned why the vessel's plotted position did not lie closer to the edge of the drag circle as would be expected under the prevailing wind and sea conditions. In fact, the vessel was plotted throughout most of the night as being more than 200 yards inside of the circle; that is, in the correct location if the drag circle had been drawn the proper size.

0000 to 0830, 4 February 1999

The wind continued to moderate, however, the swell height gradually increased from 12 to 23 feet. The watch officers testified they took numerous fixes of the vessel's anchored position, but could not provide documentation. Only the Second Officer plotted the vessel's anchored position, and these significantly

differed from the original 1900 anchor time. His plots were well westward of the positions plotted by the other officers, closer to the center of the circle. Although the vessel was still within her drag circle, there is no explanation for this position change and how it may have occurred when the direction of the wind and swells had not changed dramatically. Moreover, during the watch relief process, neither the Third nor Chief Officer questioned these markedly different positions. In each case, they testified that their fixes always placed the ship in the vicinity of the original 1900 position. Regardless of these watch keeping discrepancies, the NEW CARISSA remained safely anchored (within the drag circle plotted by the Master), and there is no evidence that it dragged prior to 0725, 4 February.

From 0600 until about 0710, the ship was being made ready to receive its cargo of wood chips. This was in accordance with the Master's night orders which were written with the assumption that the Pilot was going to board at 0730. The Third Officer relieved the Chief Officer of the navigation watch so he could supervise the pre-docking work crew who were to open the cargo hatches and place plywood around the loading hoppers.

The Master came to the bridge at 0600. At 0630 he contacted the Pilot. The Pilot was concerned about an out of position buoy in the navigation channel and wanted to personally observe the bar conditions. He told the Master he would call back shortly with information about the possibility of entering port.

At 0710, the Pilot reported that the bar was still not passable and he told the ship he would check conditions again at 0900. The crew had finished opening the hatch covers at about 0700 and the anchor detail was standing by on the bow waiting to raise the anchor. They were all under the impression that the Pilot would be boarding soon, and that the anchor would be heaved up for the vessel to proceed into port. The Master informed the Chief Officer by radio that the Pilot would be delayed until at least 0900. The Chief Officer returned to the wheelhouse at about 0715 and sent the anchor detail and Third Officer to breakfast.

While the Chief Officer was preparing the hatches, the swell continued to increase by another 2 feet, to approximately 20 feet. Although the wind speed remained generally within the 20-23 knot range, there were some gusts over 30 knots.

At about 0720, the Chief Officer sensed that the vessel was moving. Upon examining the radar, he noted a difference from the position he had taken at 0600, when he had left the wheelhouse to open the hatches. The NEW CARISSA's distance off the north breakwater had been reduced from 2.0 to 1.8 NM; the ship's

plotted position had swung to the southeast and was now 30 yards outside the drag circle drawn on the chart. He immediately informed the Master that the radar range and bearing indicated the ship was dragging anchor. The Master then ordered the Chief Officer forward, made a public address announcement to alert the crewmembers, contacted the engine room to ensure the engine was ready, and then checked the vessel's position himself to confirm the Chief Officer's plot. Upon arriving back on the bridge, the Third Officer plotted the range and bearing information obtained from the Master. This 0735 position placed the NEW CARISSA closer to shore, about 200 yards outside the drag circle drawn on the chart by the Master.

It took the Chief Officer about 5 minutes to reach the bow. Once there, he immediately prepared to raise the anchor. At about 0730 the Master ordered the Chief Officer to start heaving the anchor. Shortly after which, the Master began to maneuver the main engine ahead in order to relieve the strain on the chain and to assist with the recovery of the anchor. Simultaneously, he ordered a hard starboard rudder command. The NEW CARISSA swung to starboard and fell into the swell troughs as it now headed in a northerly direction, parallel to the shoreline. The Third Officer continued to monitor the vessel's position using radar bearings and distances from the north jetty.

The Master remained in radio contact with the Chief Officer, continuously discussing how the anchor chain was leading. Unfortunately, it quickly slid aft, down the port side, to a 7 o'clock position relative to the bow. Although the Master tried to bring the vessel back into the wind by ordering left full rudder, the ship could not power its way through the wind and swells. The Master was relegated to operating the engine and rudder as best he could to facilitate raising the anchor as the vessel slowly traveled northward. Notwithstanding his efforts, the anchor windlass periodically stopped heaving because it could not overcome the excessive strain of the anchor chain. The vessel continued to be pushed closer to shore and was subjected to a swell of increased height and steepness. Although the Master repeatedly called the engine room to demand the maximum possible power from the main engine, the engineers attempts to do this were constrained by the engine governor which would occasionally limit the power as the propeller came out of the water. Whenever the governor prevented the propeller and shaft from overspeeding, the vessel lost forward thrust.

Moreover, the Master was prevented from obtaining the speed (momentum) necessary to break through the swells and wind because the anchor and a great deal of its chain was still lying on the sea floor. For 45 minutes the crew struggled to retrieve the ship's anchor; it wasn't until 0815 that it reached the "up and down" position. Unfortunately by then, the ship was too far into the beach breakers. Realizing the

inevitable, and with the hope of protecting the ship's rudder and propeller, the Master eventually ordered the ship's bow toward the beach.

About 0830 local time on Thursday, 4 February 1999, the NEW CARISSA grounded in soft sand, 2.7 NM north of the Coos Bay Bar Channel Entrance, at position 43-23.9N, 124-19.0W. This is about 1.8 NM east-northeast from the center of the drag circle. The Master tried to back the vessel off the beach, but quickly conceded defeat.

The vessel's crew of 26 was later airlifted from the vessel by Coast Guard helicopter. No deaths or injuries occurred. Throughout this incident, the Master reportedly remained calm and issued coherent orders.

Although this investigation was restricted to the events up to and including the grounding, it is important to note that over the next several days, the NEW CARISSA gradually worked her way closer to shore, where, on the night of 08 February, she finally broke into two sections. Of the 396,400 gallons of oil aboard, it is estimated that less than 18%, or approximately 70,000 gallons, was released into the environment.

III THE INVESTIGATION

The Commander of the Thirteenth Coast Guard District ordered the formal investigation into the grounding. The Public Hearing was convened on 23 February and ended on 5 March 1999.

Concurrent to this inquiry, the United States Department of Justice was conducting a criminal investigation into the grounding and ensuing pollution. The U.S District Attorney for Oregon refused to give immunity from prosecution to the Master or crew of the NEW CARISSA. In part because of this, the testimony provided at the hearing was extremely vague, difficult to draw out, and may have been less than totally accurate. Each officer testified that they were so engrossed with their own tasks they did not observe the actions of others or the movements of the vessel. Furthermore, they each stated that all the critical decisions concerning the events were made solely by the Master and that they would not have even considered offering him unsolicited advice.

The NEW CARISSA's Master, Captain Benjamin Morgado, invoked his Fifth Amendment Rights under the U.S. Constitution not to testify before the Hearing. Captain Morgado did submit a "Statement of Facts," given to his company and obtained by the first Coast Guard Investigating Officer on scene. In this statement, the Master provided a timeline of events leading up to the NEW CARISSA's grounding:

> "0545 Tested main engine, steering gear and all bridge equipment and prepare for docking.
>
> 0630 Pilot inquired from Master the situation of the swell.
>
> 0700 Pilot advised Master to wait until 0900 for docking.
>
> 0725 The Chief Officer observed in the radar that the ship was already 1.8 miles north of the breakwater and immediately informed the Master who was also at the bridge at the time that the vessel was already dragging.
>
> 0730 The Master immediately informed the engine room who were already on standby while the Chief Officer and Bosun reported to forward station and heaved up anchor as the Master ordered in order to transfer the vessel to another anchoring position. Since the wind was so strong and the swells were too big, it

took time to fully heave up the anchor and vessel was slowly dragged into the shallow water.

0815 The Master started maneuvering the vessel when the Chief Officer reported to the bridge that the anchor is already up and down and until it was secured in the hawse pipe but the vessel can no longer respond to hard port rudder and full engine ahead.

0828 Since the vessel could no longer respond to the rudder and engine maneuvers due to the near gale winds and big swells, the vessel was dragged into the shallow waters and ran aground on the sandy bottom.

0830 The Master still tried to maneuver the vessel in the hope of pulling her out of the sandy bar by using its rudder and engine but to no avail. Thinking that the maneuver will only cause more damage than to save the vessel especially the engine, propeller and its rudder the Master finally terminated all maneuvers.

1200 Coos Bay Pilot boarded to assist Master in the maneuvering."

Captain Morgado also signed a Note of Protest which states:

"On the 4th day of February 1999 while the vessel anchored at the Coos Bay Anchorage, the vessel encountered very stormy weather boisterous and very high swell. Wind blows from westerly to south wesrly (sic) direction, force 7-8 in beaufort scale. The vessel rolled heavily to very high swell and dragged vessel to the shallow water that causes her to aground."

IV VESSEL DATA

Name:	NEW CARISSA
Flag:	Panama
Lloyd's Number:	L8716136
Call Sign:	3ELY7
Service:	Dry Bulk Freight
Gross Tons:	36,571
Net Tons:	16,524

Dead Weight Tons (DWT)	44,527MT
Length Overall:	639.4 feet
Home Port:	Manila
Date Built:	30AUG89
Place Built:	Japan
Built by:	Imabari Shipbuilding Co. LTD
Propulsion:	Direct Drive Diesel Mitsubishi Sulzer 6RTA52
Horsepower:	8200 BHP
Classification Society:	Nippon Kaiji Kyokai (Vessel was in class)
P&I Club:	The Britannia Club
Owner:	Green Atlas Shipping, S.A. Panama 4th Floor, Okwada Bldg., 25-6 Taito 2-chome Taito-ku, Tokyo Japan 110-0016
Operator:	TMM Co. LTD. 4th Floor Ohwada Bldg 25-6 Taito, 2-Chome Taito-Ku Tokyo Japan
Ship Guarantor:	Shipowners Insurance & Guarantee Co. P.O. Box HM 3398 Hamilton HM PX Bermuda

V WEATHER

Mr. Dan Keeton from the National Weather Service testified as to the weather forecasts made available and to the actual weather conditions experienced by the NEW CARISSA. A detailed account of his testimony is available in Appendix 1. An abbreviated version follows:

On Wednesday, 3 February, the prevailing winds were blowing from a low pressure system located southwest of Coos Bay into a northern low pressure system north of Coos Bay, producing south-southwesterly winds. The frontal system moved onshore that evening as a secondary trough (lower pressure) approached the coast.

At 1900 Wednesday evening, 3 February, the environmental situation in the vicinity of the NEW CARISSA had north-westerly swells of approximately 12 feet and the wind from 210 T (SW) at 31 knots, with gusts up to 39 knots (as recorded at Cape Arago Lighthouse). For the next three hours the wind and swell height did not change appreciably. Around midnight, the swells began to increase, ultimately reaching 20 feet by 0800. In contrast, by this time, the winds had decreased to 22 knots. These changing conditions had been predicted by the weather service prior to the NEW CARISSA's arrival to the Oregon Coast; and updated heavy surf and gale warnings were issued throughout the night.

Additional environmental influences included the occurrence of low tide at 0834 on 4 February, which resulted in the surf break moving further out from shore, and a slight north setting offshore current.

VI OTHER INFORMATION

Anchors

The NEW CARISSA was equipped with cast steel stockless anchors. The port side anchor weighed 6545 kgs and the starboard side weighed 6560 kgs. Both anchor chains were 73mm in diameter and 316 meters (11 shots) in length.

Course Recorder

The vessel's course recorder tape was of no use to the investigation. The tape provided at the hearing lacked date and time reference marks, but moreover, it was not indicative of the testified movements of the vessel.

Fathometer

The fathometer tape was no use to the investigation because equipment had been turned off after anchoring and never turned back on.

Log Book

The logbook entries regarding the weather conditions faced by the NEW CARISSA on 4 February were not filled in until the day following the grounding. The Master verbally told the Third Officer what the weather entries were and the Third entered them as ordered. All the officers testified that it is their normal practice to make log book entries only at the end of each watch. On 3 and 4 February, only the Second Officer actually made log entries before leaving the bridge.

Communication Equipment

There was no evidence of problems or discrepancies regarding any communications equipment of the parties involved in this casualty.

GPS

The Global Positioning Satellite receiver was obtained, but no data was recovered because the battery had died.

Voyage Data Recorders

The NEW CARISSA was not fitted with voyage data recording equipment which would have presented an unbiased view of the events and conditions the NEW CARISSA encountered on 3 and 4 February 1999.

VII DECK OFFICER INFORMATION

Captain Benjamin Morgado was the Master of the NEW CARISSA. Captain Morgado is a Filipino national and holds a Bachelors of Science degree in Marine Transportation. He holds both a Panamanian and Philippine license as Master for ocean going vessels of 3,000 gross tons or more (with radar endorsement). He has held this license since 1994. He had been aboard the NEW CARISSA since May 18, 1998.

Mr. Angelito Tumulak was the Chief Officer aboard the NEW CARISSA. Mr. Tumulak is a Filipino national and holds an Associates degree in Nautical Science. He holds both a Panamanian and Philippine license as Chief Officer for ocean going vessels 3,000 gross tons or more (with radar endorsement). He has sailed as chief officer on several ships since 1995. He had been aboard the NEW CARISSA since December 2, 1998.

Mr. Alfonso Chua was the Second Officer aboard the NEW CARISSA. Mr. Chua is a Filipino national and holds an Bachelor of Science degree in Marine Transportation. He holds both a Panamanian and Philippine license as Second Officer for ocean going vessels 3,000 gross tons or more (with radar endorsement). He has sailed as second officer on at least three other vessels. He had been aboard the NEW CARISSA since December 3, 1998.

Mr. Patriotico Viguilla was the Third Officer aboard the NEW CARISSA. Mr. Viguilla is a Filipino national and holds a Bachelors of Science degree in Marine Transportation. He holds both a Panamanian and Philippine license as Third Deck Officer for ocean going vessels 3,000 gross tons or more (with radar endorsement). He received a Third Officers license in December 1994. He had been aboard the NEW CARISSA since December 2, 1998.

Except for the Master, this was the first voyage for all the deck officers of the NEW CARISSA, all having boarded three months earlier.

A review of all crewmember qualifications and Standard of Training, Certification and Watchkeeping for Seafarers (STCW) determined that the crew was properly certified for their duties onboard.

All crewmembers claimed to have had sufficient rest prior to the grounding.

VIII SPECIFIC FINDINGS OF FACT

The following bold and bulleted lines of text are the facts that have a relationship to the cause of the grounding. Following each fact are explanations of testimony and matters of record derived.

a. The ship's officers used many resources to plan for the voyage to Coos Bay, however, the U.S. Coast Pilot was not one of these documents.

The Second Officer was responsible for voyage planning. The only information the Master gave him was that the next port was Coos Bay. This was Second Officer's first trip to this southern Oregon port. He reviewed the "Passage Planning" section of the ship's Safety Management System for guidance, however, it did not detail exactly what references must be used. He eventually used the Sailing Directions, Notice to Mariners, and the Pacific Pilot Chart to plan the voyage from Japan to Coos Bay. In addition, he referred to the Guide to Port Entry[2] to get general information about Pilot station locations and local time zone information for ports. However, he testified it was the Master's responsibility to research and compile more detailed information regarding the ports the ship was scheduled to visit. Consequently, the Second Officer could not provide much insight into the unexpected decision to anchor offshore. The Master made the decision to anchor, chose the location; and did not discuss his reasoning with anyone.

The Second Officer did not read the U.S. Coast Pilot. This publication does state that the area northeast of the entrance buoy has good holding ground, sand bottom, for deep-draft vessels to anchor. Moreover though, it contains information on how to contact the Coos Bay Pilots by telephone; has information regarding the prevalent weather conditions in the Coos Bay, Oregon coast area; and provides warnings that the weather changes suddenly in this area during the winter months.

[2] Neither the Pilot Chart nor Guide to Port Entry were produced at the hearing.

b. The NEW CARISSA was scheduled to enter Coos Bay at 1900 on 3 February 1999. However, the vessel's entry into Coos Bay was postponed by the Coos Bay Pilot due to poor weather conditions and in part because of his concern about an out of position navigation buoy in the entrance channel.

At 1700 on 3 February, the NEW CARISSA first contacted the Coos Bay Pilots and informed them of a 1900 estimated time of arrival (ETA) to the Pilot Station. The Pilot replied that the vessel would be delayed until 0730, 4 February due to the weather conditions.

The Coos Bay Pilot was concerned that the winds within the Bay were too strong to safely moor the vessel. He noted that the Coast Guard had confirmed Buoy 4 in the Coos Bay entrance channel was off station. Although this caused him some concern, it was secondary to the weather conditions in his decision not to bring the vessel in. The decision to take a vessel across the Coos Bay bar is solely the responsibility of the duty Pilot; there are no written standards describing when it is unsafe for a Pilot to bring a vessel into harbor.

At 0700 on 4 February, the Pilot was at the Coast Guard watch tower which is located on a bluff overlooking the entrance to Coos Bay. He noted that Buoy 4 had moved further off station, approximately ¼ to ½mile to the west of its charted position. Considering the weather conditions and the out of place buoy, the Pilot informed the NEW CARISSA that there would be a further delay until 0900.

The watch tower bar report, for 0715 on 4 February, recorded 16-20 foot seas near Buoy 3, with winds from the west at 20 to 25 knots.

c. At 1900 on 3 February 1999, the NEW CARISSA anchored 1.5 NM offshore in position 43-23.5N, 124-21.2W, letting out 7 shots of chain in approximately 100 feet of water.

The Master sent two messages that evening about the vessel's anchoring. The first was from the NEW CARISSA to TMM Tokyo, stating that the vessel was at anchor. It also stated that "the Pilot don't like to board N bring vsl (sic) to berth tonight due to strong

wind N Heavy swell outside." The second message notified TMM Tokyo of the NEW CARISSA's anchored position at 1900 as 43-23.5 N, 124-21.2W. This concurs with the position marked on the chart.

Upon reporting to the watch tower at 0700 on 4 February, Coast Guard personnel noted the NEW CARISSA was anchored northeast of buoy "K", with its bow heading toward the southwest. Although slightly closer to shore, it appeared to be in the general area where other deep draft vessels have anchored in both the summer and winter. It did not seem to be in any trouble.

Although the NEW CARISSA did not anchor in the vicinity marked by the anchor symbol found on chart 18587, the chosen location was where Coos Bay Pilots typically anchor vessels. The position was 0.8 NM northeast of the anchor symbol, placing the vessel further away from the entrance channel to Coos Bay and further away from the northern dredge spoil dump site. The distance offshore was approximately 1.7 NM, whereas the anchor symbol is 1.85 NM from the beach.

d. The Master of the NEW CARISSA was solely responsible for making the decisions to anchor.

The ship's deck officers all testified that the Master alone decided where and when to anchor. He did not request their advice, nor any guidance from the Coos Bay Pilots or the Coast Guard.

e. After anchoring, the Master did attempt to notify the Coos Bay Pilots of the NEW CARISSA's anchored position per the vessel's SMS manual.

Within the span of one minute, the NEW CARISSA made four radio calls to the Pilots but did not receive any response. The ship did not make any further attempts to inform the Pilots about its location.

f. The Coos Bay Pilot did not offer advice on what the NEW CARISSA should do, or inquire as to what the Master's intentions were.

During a VHF radio conversation on the evening of 3 February, the Pilot assumed the NEW CARISSA was 12-15 NM offshore and would run courses at sea or just drift throughout the night.

On the morning of 4 February, the Pilot was surprised to see the NEW CARISSA at anchor. He did not ask or instruct the vessel to get underway since he assumed it would be doing so shortly in order to meet him at the originally planned 0730 boarding location.

g. The NEW CARISSA's deck officers did not review the National Weather Service information. The weather was forecast as gale force with increasing heavy surf through the next morning. The observed weather occurred as predicted.

The Chief Officer testified that the Master saw some of the weather reports on 3 February 1999. The deck officers stated they were aware of the weather information received, however, all of them stated that the Master alone reviewed this information.

At 0115, the National Weather Service (NWS) broadcast a heavy surf advisory of large offshore swells in excess of 30 feet which would generate coastal surf up to 25 feet. The Master had come to the bridge at 0200 and this NWS forecast was available for his review. It is unknown if he read this forecast.

h. The NEW CARISSA's deck officers used only the radar to determine the vessel's anchored position and used an excessively large drag circle to watch for dragging.

The Master placed an anchor drag circle on the chart and subsequent watch officers ensured that the vessel remained within it throughout the night. This circle reflects the maximum distance around the anchor that the vessel could move if the anchor was holding properly. If the vessel's position were outside of this circle, it would indicate the vessel was dragging anchor. Normally, it is expected that a vessel should weather vane with the wind and lie close to the edge of this circle.

Upon review of the drag circle placed on the NEW CARISSA's chart, it was determined that its radius was 200 yards too large.

A drag circle provides a means to readily determine if the ship's anchor is holding properly. The plotted positions of a vessel at anchor should remain within the drag circle, generally near its edge as the ship swings (weathervanes) in relationship to changing wind and swell direction. A radius of a drag circle is calculated by adding the length of chain let out (7 shots, 630 feet) to the length of the vessel from the bow to the ship's bridge (approximately 600 feet). In this case, the correct distance for the circle should be about 1230 feet (410 yards). It is not known why a 610 yard circle was drawn on the chart. Moreover, none of the deck officers questioned why the vessel's plotted position did not lie closer to the edge of the drag circle as would be expected under the prevailing wind and sea conditions. In fact, the vessel was plotted throughout most of the night as being more than 200 yards inside of the circle; that is, in the correct location if the drag circle had been drawn the proper size.

The deck officers used a single radar bearing and range off the end of the north jetty of the Coos Bay Entrance Channel to ensure the vessel maintained its position. Testimony indicated that the north jetty is the best location to obtain radar lines of position. Although each deck officer testified to using the same spot on the jetty to ascertain the ship's position, a review of the NEW CARISSA's navigation chart shows a 150-yard variance in the lines of positions taken along the jetty over the next 13 hours while at anchor and dragging. An excerpt from the 0115 NWS broadcast may give an explanation for the differences: "Exposed structures such as jetties can be inundated by high surf."

Although visibility varied throughout the night as rain and light mist passed through the area, no additional aids to navigation were used, such as the Cape Arago Light which is located approximately 3.2 NM to the south of the NEW CARISSA's anchored position. This light is 100 feet above the water and has a 17 mile range. A second visual aid, located at Coos Head, is a 4 mile light, 90 feet high. This light was approximately 2.7 NM from the vessel's anchored position. A third possible visual aid, which was 2.3 NM from the ship, is 23 feet high and located on the north jetty. It has a range of 3 miles.

i. The Master issued night orders and each officer read and signed them before assuming their watch. They were directed to notify him if the anchor dragged or if the wind force increased.

The Master's standing orders for the vessel were recorded in the vessel's Bridge Order Book as follows:

"Bridge Order Book Coos Bay Anchorage 3rd Feb 99.

1. Observe bridge standing orders.
2. Check anchor position frequently by visual or radar bearing to insure if vessel maintain anchor position.
3. Call me at slightest sign of anchor dragging also inform the E/R.
4. Vessel at her port anchor 6/7 shackle in the water.
5. Call me at 0500H. Also try engine one hour B4 Pilot boarding (0730H).
6. Call me anytime if wind force increases.
7. Call deck hands at 0530H to prepare cargo hold for loading."

The Third Officer stood watch from 1900 until 0000, the Second Officer from 0000 until 0400, and the Chief Officer from 0400 until 0800. During breakfast and dinner, the watch officer was relieved by another mate.

The Master appeared on the bridge around 0200 on 4 February 1999, however, the Second Officer could not recall if a conversation occurred. Throughout the time the vessel was anchored, no one called the Master to report an issue relating to his standing orders.

j. The anchor watches maintained throughout the night were uneventful.

None of the officers were concerned that the NEW CARISSA was dragging anchor because the vessel remained within the drag circle throughout the night.

The Second Officer (0400-0800 watch) testified to fixing the vessel's position many times, maybe as often as every 15 minutes, but did not mark the chart so long as the ship remained within the drag circle. Plotted positions for 0000 and 0400 appear on the chart showing the vessel had swung 0.1 NM and 0.2NM respectively from the 1900 anchor positioned. These were well west of the positions noted by the other officers, closer to the center of the circle. Although the vessel was still within her drag circle there is no explanation for this position change and how it may have occurred when the direction of the seas and swells had not changed appreciably. No other watch officer questioned these markedly different positions.

When relieved by the Chief Officer at 0400, the Second Officer relayed that there was no sign of dragging, that the ship had a good position, and that the weather and wind had decreased. As far as he knew, all bridge recording equipment was working properly at the time of the grounding. The Chief Officer checked the NEW CARISSA's position using the radar and noted that the vessel remained within the drag circle put on the chart by the Master the previous night. The Chief Officer testified that he checked the vessel's position at 0430, 0500, and 0530--and each time the position was the same.

k. The crew of the NEW CARISSA raised the hatch covers to prepare the holds for cargo operations prior to weighing anchor. Although this increased the vessel's wind area, it did not significantly impair the vessel's ability to maneuver.

Shortly after 0600, after having turned the navigation watch over to the Third Officer, the Chief Officer supervised the opening of the cargo hatches in preparation for taking on cargo. The hatch covers are about 80 feet long and 80 feet wide. Half the hatch folds forward and the other half aft. Each section rises 20 feet into the air.

The Coast Guard Marine Safety Center conducted an analysis which concluded that wind hitting the raised hatch covers at an angle of 52 degrees off the bow adds 3% to 5% to the vessel's windage. This would greatly hamper the rudder's effectiveness when underway. However, if the vessel were in the trough with the wind on its beam, the additional windage of the side profile of the raised hatch would have minimal affect. The analysis concluded that if the vessel had enough rudder side force to overcome the beam wind condition, it should have sufficient rudder force to turn completely into the wind.

However, the analysis did not address the effect of wave forces on the NEW CARISSA's ability to turn. These forces can be significant, especially in the case of a vessel caught in heavy seas.

The Pilot did not know the vessel was going to raise its hatch covers while still offshore. He testified that although this is apparently a common practice, if asked, he would advise against it for two reasons. First, the hatches impair visibility from the navigation bridge, and secondly, the hatches will catch a lot of wind. In his experience, the hatch covers act as sails catching the wind. However, as discussed in the Marine Safety Center's analysis, the additional wind profile of the raised hatches is mostly blocked by the loading hoppers installed above each cargo hold.

l. The Chief Officer was the first to discover that the vessel was dragging anchor at approximately 0725. Shortly after being notified, the Master decided to weigh anchor and move seaward.

At 0700 the Chief Officer was sent forward to weigh anchor in anticipation of meeting the 0730 Pilot boarding time agreed to the previous evening. Shortly thereafter, the Master informed him that the Pilot would be delayed until 0900. At about 0715, the Chief Officer proceeded to the bridge to resume his watch.

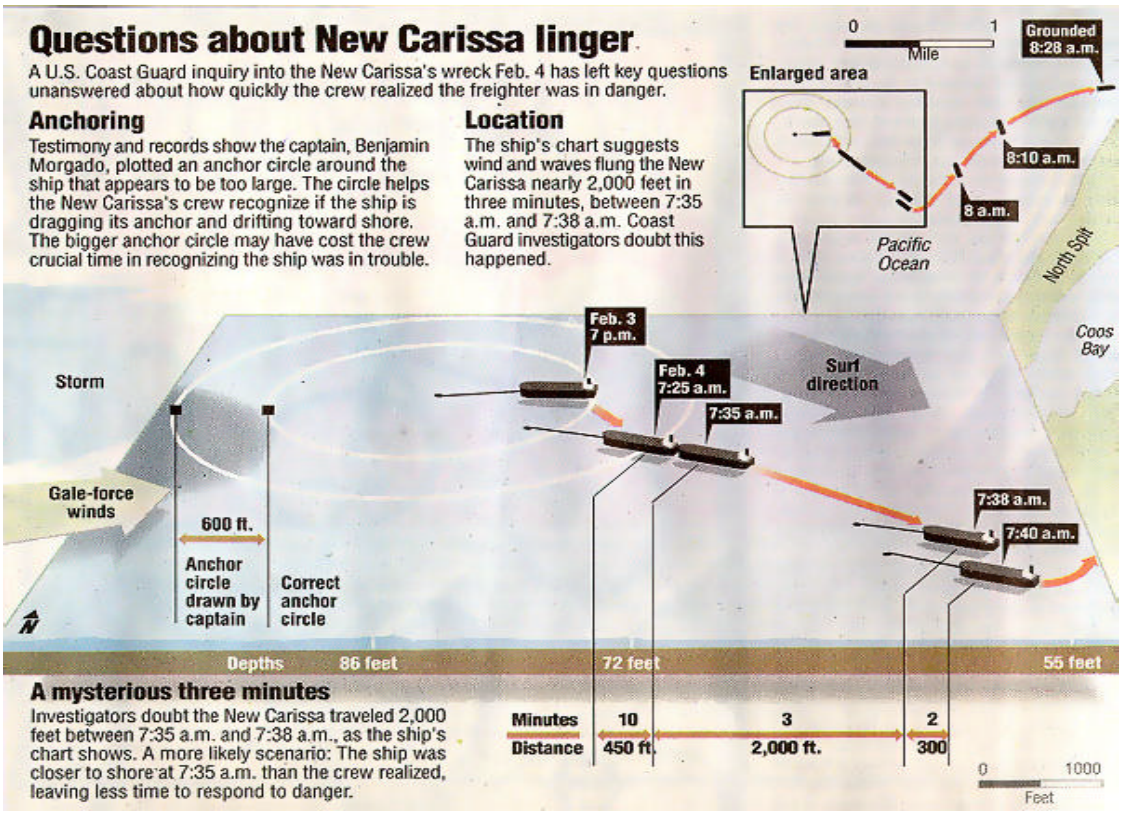
After relieving the Third Officer, the Chief Officer testified the wind changed suddenly, and he saw objects ashore moving relative to the ship. He was alarmed that the movement of the shore objects and their apparent change in bearing indicated the ship may be dragging. None of other officers on the bridge, including the Master, was aware that the vessel was dragging anchor.

The Chief Officer immediately looked into the radar and found that the vessel was 1.8 NM from the breakwater and approximately 30 yards outside of the anchor drag circle that the Master had placed on the chart the previous evening. This would place the ship 240 yards outside the correct drag circle due the aforementioned error in drawing it.

After informing the Master that the ship was dragging, the Chief Officer was instructed to immediately proceed to the bow and prepare to weigh anchor. He estimated it took him 5-6 minutes to get to the bow from the bridge.

m. The 0725, 0735 and 0738 positions on the chart which were used to justify that the vessel was dragging uncontrollably are unreliable.

The graph representation below best illustrates an overriding question which the hearing was unable to resolve, that being an explanation of how the NEW CARISSA could travel at a speed of 7 knots with its anchor on the bottom and engines going ahead. Specifically, the ship's officers could not explain how the vessel traveled 700 yards (0.35 NM) during the three minute period between 0735 and 0738.



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[3] This graphic is included with the permission of the OREGONIAN. It was published in a March 1999 edition under an article written by Mr. Brent Wahl. This visual presentation was part of ongoing coverage and it was not published with the intent of affecting this investigation in any way. The OREGONIAN does not make any claim that this is how the casualty actually occurred nor does the OREGONIAN claim to agree or disagree with this report.

n. The NEW CARISSA's equipment, machinery and other gear were in proper working order.

There were no problems reported with the NEW CARISSA's machinery, anchoring gear, or bridge equipment. Although the course recorder tape was of no use to the investigation, the Chief Officer testified that it had been working properly as they approached Coos Bay.

The engine was on stand-by the entire time the NEW CARISSA was anchored. At 0545, per the Master's Night Orders, the Chief Officer tested the engine by going briefly ahead and astern. It responded properly, no problems were noted. The engine order telegraph also worked correctly, however, it was for communications only and did not directly control the engine. An engineer standing by the telegraph operates other controls to work the engine.

During the emergency maneuvering, the Chief Engineer reported the engines worked properly at all times. Following the grounding, a Coos Bay Pilot boarded the vessel and testified that the engineering plant and navigation gear appeared to be operating properly and both anchors were in the hawse pipes.

o. While weighing anchor, the NEW CARISSA over-rode her anchor.

It took the Chief Officer about 5 minutes to reach the bow. Once there, he immediately prepared to raise the anchor. At about 0730, the Master ordered the Chief Officer to start heaving the anchor. At 0734 , the Master ordered the main engine ahead in order to relieve the strain on the chain and to assist the recovery of the anchor. Simultaneously, he ordered a hard starboard rudder command. The Master remained in continuous radio contact with the Chief Officer discussing how the anchor chain was leading. Throughout the emergency maneuvers, the anchor windlass periodically stopped heaving because it could not overcome the heavy strain on the anchor chain.

The Chief Officer testified that the vessel's bow was heading approximately due west when he got to the bow and started heaving in the anchor. When ordered by the Master he engaged the windlass, released the brake and began heaving; two shots of chain were

retrieved without incident. With five shots remaining in the water, the anchor windlass came under very heavy strain and began to stall periodically. At this time, the chain was leading to the 12 o'clock position, directly out from the bow. As the ship came forward on its engines, the chain slid back to the 9 o'clock position on the port beam and slackened, allowing the anchor windlass to haul in again.

As the chain continued to slide further aft, eventually to the 7 o'clock position, the windlass stalled as it could not overcome the excessive strain on the chain. By this time the vessel had swung around from the previous westerly heading to the north- northeast. It was now in the trough of the swell, parallel to the shore.

p. The NEW CARISSA's anchor, which did not come off the bottom until 0815, hampered its ability to maneuver.

According to the chart and bell book, the vessel's anchor did not reach the "up and down" position until 0815, 45 minutes after the Master gave the order to raise it. The ship could not escape seaward because the anchor and a great deal of chain were still lying on the sea floor, limiting its maneuverability and preventing the ship from obtaining the speed (momentum) necessary to break through the swells and wind.

q. The NEW CARISSA's trim condition hampered its ability to maneuver.

Except for number 3 and number 4 double bottom and the after peak ballast tanks, which were empty, the vessel was fully ballasted, including the number 4 cargo hold. The vessel's draft was 25 feet 9 inches aft and 16 feet 4 inches forward, resulting in an approximate 9 1/2 foot stern trim.

Both Coos Bay Pilots testified that the additional bow wind area resulting from the NEW CARISSA's stern trim condition would accentuate the effect of the wind, forcing the bow to rapidly swing once the anchor stopped holding. The Pilots theorized that when the Master tried to pick up his chain, a wind gust blew his bow off to the right. The light, high bow with the raised cargo hatch covers may have forced the vessel to swiftly swing to starboard.

The anchor chain moved from the 12 to 7 o'clock position on the vessel's port side as a result of several factors: the additional windage of the open cargo hatches and raised bow, inconjuction with, the Master's initial hard starboard rudder command and ahead engine order. The ship aspect to the wind quickly brought the bow to starboard and heading north. Once heading north, its port side was fully exposed to the wind and seas.

r. Once the NEW CARISSA was in the surf zone, the propeller periodically came out of the water hampering its ability to maneuver.

The Chief Engineer testified that the propeller came out of the water frequently, resulting in a loss of forward thrust for up to 30 seconds at a time. The engine is protected by two safety features. The first being the automatic overspeed trip which never activated because the second, the engine governor, continuously slowed engine RPMs as the propeller kept coming out of the water.

The helmsman noted that the propeller came out of the water several times, which he recognized by the ship's vibrations. He further stated the vessel would not turn to port.

The Coast Guard watch stander testified the NEW CARISSA's propeller came out of the water several times as the vessel was proceeding north. It was apparent to him that the vessel was attempting to come to port but was being continuously shoved to starboard by the large waves. This observation was made while the NEW CARISSA was within the shoreline breakers.

s. About 0830 local time on Thursday, 4 February 1999, the NEW CARISSA grounded in soft sand 2.7 NM north of the Coos Bay Entrance Channel, at position 43-23.9N, 124-19.0W.

t. Coos Bay Pilot Captain Steve Woods attempted to remove the NEW CARISSA from its grounded position.

Captain Woods overheard the VHF-FM radio discussions regarding the NEW CARISSA at 0840. He went to the Coast Guard tower, arriving at 0900. There he met Captain Sweet, the Pilot who had been conversing with the NEW CARISSA up to this point. They both looked at the vessel and discussed what might be done about the grounding.

Captain Woods believed that the NEW CARISSA might be able to back off the beach and offered his service to the NEW CARISSA's agent. At 1140 he was placed aboard the NEW CARISSA by a Coast Guard helicopter.

During the next 24 hours, Captain Woods attempted to back the NEW CARISSA from the beach. Once it was realized that the vessel could not be removed under its own power, he attempted to keep the stern headed to sea to prevent the vessel from broaching. Eventually the vessel was overcome by the wind and sea conditions and shoved parallel to the shore. Captain Woods then departed the vessel.

u. There were no tugs available to assist the NEW CARISSA.

There was one tug in Coos Bay, however, it could not come to the NEW CARISSA's assistance because the Coos Bay Bar was unsafe to cross. There were no other tugs available in the southern Oregon coast vicinity which could have assisted the vessel once firmly aground.

v. Drug testing was completed in a timely fashion and the results of all tests were negative for the use of any drugs or alcohol.

A Coast Guard law enforcement petty officer from Coast Guard Station Coos Bay, certified to use the ALCO SENSOR breathalyzer, tested 5 crew members for the presence of alcohol. The tests were administered around 1640 (4:40 PM), 8 hours after the ship went aground. The individuals screened were those who were on watch at the time the vessel went aground: the Master, Third Officer, Radio Officer, Second Engineer, and the 04-08 watch helmsman. All tests were negative.

Drug tests were conducted on the Master and seven crew members who had direct involvement or were standing watch at the time of the incident. This included all three deck officers (anchor navigation watch), the Radio Officer (engine order telegraph), both helmsmen, the Second Engineer , and the engine room oiler.

An officer from Coast Guard Group North Bend collected the urine samples using Coast Guard procedures. These samples were submitted to Oregon Medical Laboratories, a SAMHSA (Substance Abuse and Mental Health Services Administration, HHS)

approved facility. Because the samples were submitted on Department of Defense forms, the laboratory did not use the Department of Transportation protocols as required by 49 CFR 40. Instead of a 5 panel test, 10 drugs were screened. For the 5 drugs required to be tested by DOT, the DOD threshold limit is the same. All test results were negative for drugs and alcohol

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ANALYSIS

Criminal Investigation

This investigation was severely hindered by the pall of the anticipated criminal prosecution of the NEW CARISSA's Master. The entire crew testified the Master alone, made all the critical decisions and issued the orders which eventually resulted in the NEW CARISSA going aground. Due to the looming criminal case, the Master's attorney, a criminal defense lawyer, advised her client not to testify. Consequently, the Master invoked his Fifth Amendment Rights under the U. S. Constitution and did not testify.

The lack of this vital testimony, combined with the other witness' claims that the Master was the sole decision-maker, made determination of the cause of this casualty difficult. An apparent disconnect between the objective to set blame and the goals of determining cause and preventive measures resulted in much supposition regarding the Master's decisions and orders.

Casualty Analysis

There did not appear to be any driving factors regarding fuel consumption, fuel costs, or any other concerns about the NEW CARISSA's fuel status that affected the Master's decision to anchor.

The NEW CARISSA's transit across the Pacific Ocean was marked by several storms and generally poor weather. This may have factored into the Master's decision to anchor off Coos Bay. Had the vessel and crew been experiencing any fatigue from the rough weather, the Master may have believed the ship would ride smoother at anchor and allow the crew to get better rest.

Instead of immediately noting the vessel dragging toward shore, the Master's miscalculation of the anchor drag circle lulled the deck watch officers into assuming the ship was still floating safely at anchor. Had the proper drag circle been on the chart, they would have discovered the vessel drifting into danger much sooner.

By anchoring off Coos Bay, the Master gave himself and his watch officers little margin for error if anything went wrong. Although he did not testify, his attorney let it be known that this was the Master's second visit to Coos Bay, Oregon. As was expected this time, during the previous visit, his ship was taken directly into port.

Observations of witnesses ashore and discrepancies with the marks on the chart appear to indicate that the NEW CARISSA was much closer to shore when the Chief Officer first announced that the ship was dragging anchor. The quick movement of the vessel towards the beach, wherein the ship traveled 0.35 NM in three minutes, contradicts the written statement of the Master that " the vessel was slowly dragged into shallow water by the wind and wave."

CONCLUSIONS

1. The root cause for the NEW CARISSA going aground was the Master's failure to make proper allowances for the effects of weather and sea conditions that should have been reasonably foreseen. The Master had at his disposal the U.S. Coast Pilot information which warns of extreme weather on the Oregon Coast during the winter. He also had frequent NWS broadcasts indicating worsening seas. Nonetheless, he chose to anchor on a leeward shore, during a gale, in the winter without taking additional safety precautions; not even taking the minimum measure of laying out additional anchor chain. This action allowed the vessel to be put in a position in which it could not recover once it began to drag anchor.

2. There is evidence of negligence on the part of the Master of the NEW CARISSA in deciding to anchor off Coos Bay, Oregon. The decision not to remain underway ultimately resulted in the vessel going aground.

3. It appears that the Master of the NEW CARISSA made an error in judgment regarding how he chose to anchor the vessel. He had available additional chain, a second anchor, and the ability to motor ahead slowly in an effort to reduce the strain on the chain while anchored.

4. There is evidence of negligence on the part of the ship's navigation officers in their watch standing. The Chief Officer and Third Officer used only one reference point to ascertain the vessel's position, even as the environmental conditions deteriorated, they failed to effectively monitor the vessel's position, to maintain accurate records of their watches, to heed the forecasted weather, and to immediately determine that the vessel was dragging. It is possible that the vessel had been dragging slowly for quite awhile and that the Master, if provided more warning, could have taken better preventive measures

5. The NEW CARISSA's crew did not effectively document their actions. Logs were poorly maintained, as was the chart. This significantly hindered the Investigation's ability to retrace actions taken and determine the appropriate actions to prevent future groundings.

6. The NEW CARISSA's anchor began to drag as a result of the increasing swell height. The additional wind area of the raised hatch covers cannot be discounted outright as a factor, but the periodic high gusts of wind on the morning of 4 February were no greater than the sustained winds the vessel experienced while remaining safely anchored throughout the night.

7. Once the NEW CARISSA began to drag anchor, the Master's decision to weigh anchor and get underway was prudent.

8. Once the NEW CARISSA became trapped in the swell trough, with the wind and seas both on its port side, the vessel was no longer able to maneuver to seaward. Given enough sea room, a vessel in this predicament could head down wind to gain sufficient speed and momentum before turning to power its way through the wind and seas. However, this was not an option for the NEW CARISSA because of its proximity to the shore.

9. The jurisdiction of the Coos Bay Pilots is unclear. The State Law governing the State Pilotage Grounds is unclear and not specific enough as to the extent of jurisdiction. As defined, there is no designated north or south boundary nor an explanation as to when a Pilot is required for vessels wishing to anchor offshore.

10. There is no evidence that personnel of the Coast Guard or other federal, state or local agency, or any other person contributed to this casualty; nor is there any indication that ship's equipment or material did not function as designed.

11. There is no evidence that the NEW CARISSA went aground as a result of a criminal act having been committed.

RECOMMENDATIONS

The following recommendations are forwarded to prevent future occurrences of this nature:

1. That the National Oceanographic and Atmospheric Administration place a written warning in the U.S. Coast Pilot, Number 7 and pertinent National Ocean Survey Charts reflecting that the coastline of Coos Bay, Oregon, is not a safe place to anchor during the winter months because of the rapid and severe onset of weather. The Coos Bay Pilots should meet with the Coast Guard and local maritime interests to develop the locations, weather conditions, and timeframe for this warning. (Conclusions 1, 2, 3, 6, 8)

2. That all vessels, including bulk vessels, be required to have voyage data recorders that ensure course, speed, vessel rolling, wind speed and direction, water depth, rudder movements, engine direction and RPMs, and vessel position are captured. Conflicting testimony, the need to protect individual's Fifth Amendment rights, and the inability of witnesses to remember facts hinder investigations and thus preventative actions. (Conclusions 4, 5, 8)

3. That the Coast Guard work with the maritime industry to develop safety guidelines to address the common practice of raising cargo hatches on bulk vessels prior to mooring. (Conclusion 6,8)

4. That the State of Oregon provide clear and conclusive regulations which specifically detail where and when a Pilot is required to be aboard vessels. This information should clearly establish offshore boundaries and should also address the use of a Pilot to anchor vessels off the Oregon shoreline. Once developed, these regulations should be included in the U.S. Coast Pilot, Number 7. (Conclusion 9)

5. That civil penalty action may be considered against Captain Benjamin Morgado for negligent operation, in violation of 46 United States Code 2302. (Conclusions 1, 2, 3, 4, 5)

6. That civil penalty action may be considered against Chief Officer Angilito Tumalak for negligent operation, in violation of 46 United States Code 2302. (Conclusions 4, 5)

7. That civil penalty action may be considered against Third Officer Patriotico Vigallia for negligent operation, violation of 46 United States Code 2302. (Conclusions 4, 5)

8. That the Republic of Panama and the Republic of the Philippines be provided a copy of this report with a recommendation they examine the proficiency and competency of Captain Morgado, Chief Officer Tumulak, and Third Officer Viguilla... (Conclusions 1 through 11)

9. It is recommended this casualty investigation be closed. There is no need to have a Marine Board of Investigation conduct any further inquiry into this matter.

APPENDIXES

Appendix 1: WEATHER DATA

a. Weather Prediction/Recording Equipment at Coos Bay Oregon

Weather data from three locations was used to piece together the weather picture observed off Coos Bay, Oregon, during the period of 3 and 4 February 1999. Two offshore buoys and one land station recorded the weather conditions. Each of these sites are owned and maintained by the National Oceanographic and Atmospheric Administration (NOAA).

Buoy 46050 (hereinafter referred to as buoy 50) is a three-meter discus buoy located approximately 32 NM off of Newport, Oregon, at position 44-62N and 124-53W, which is approximately 100 NM north of Coos Bay. This buoy records wind speed, gust and direction information, wave height and period information, barometric temperature, atmospheric pressure, and sea surface temperature.

Buoy 46027 (hereinafter referred to as buoy 27) is a three-meter discus buoy located at position 41-85N and 124-39W, which is approximately 15 NM offshore of the Oregon-California border, approximately 100 NM south of Coos Bay. This buoy also records wind speed, gust and direction information, wave height and period information, barometric temperature, atmospheric pressure, and sea surface temperature.

Cape Arago Light House is the closest weather recording station to the NEW CARISSA's anchored position. It has weather monitoring equipment to read wind speed, gust, and direction information. Sea related information is not recorded. Cape Arago is located at position 43-34N and 124-38W, approximately 3.2 NM south of the ship's anchored position. The structure is located 18 meters above mean sea level.

There is no weather information buoy located directly offshore of Coos Bay, Oregon.

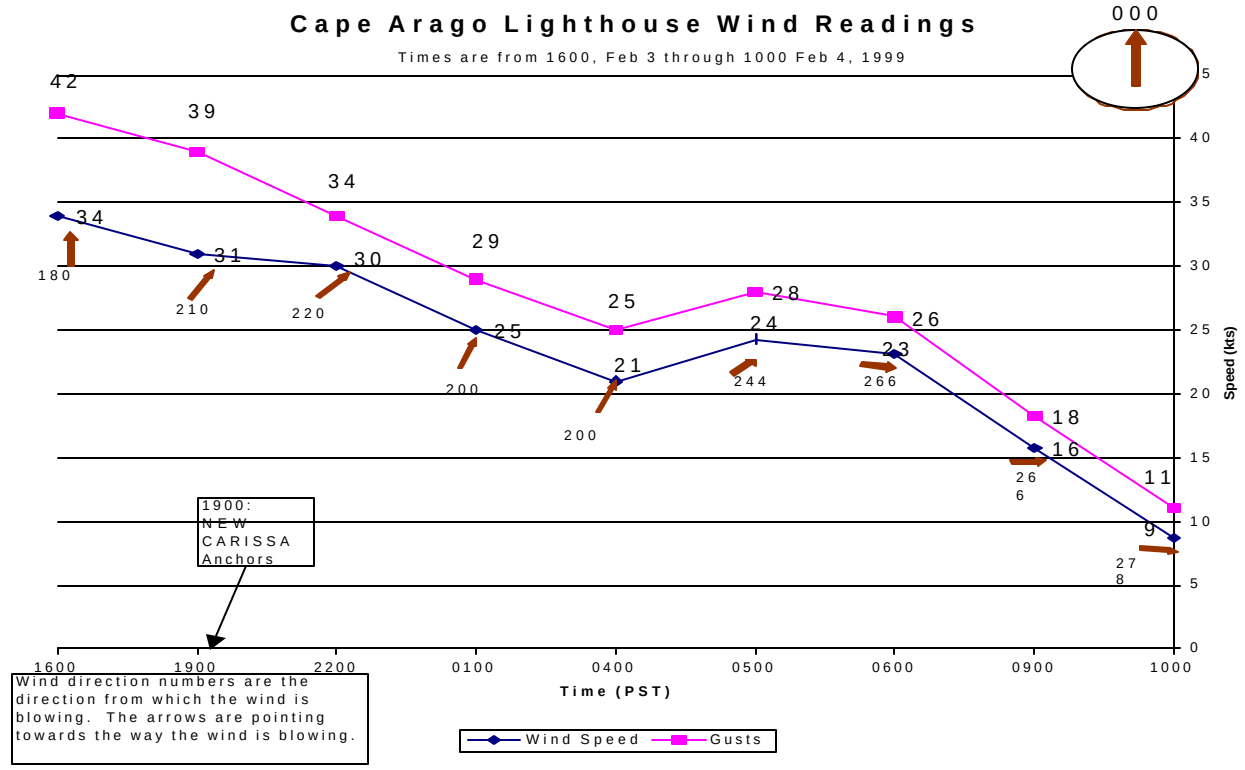
Weather forecasts are issued by the National Weather Service (NWS) in several forms. The first is the daily weather update. This information is transmitted by the NWS and also retransmitted, without change

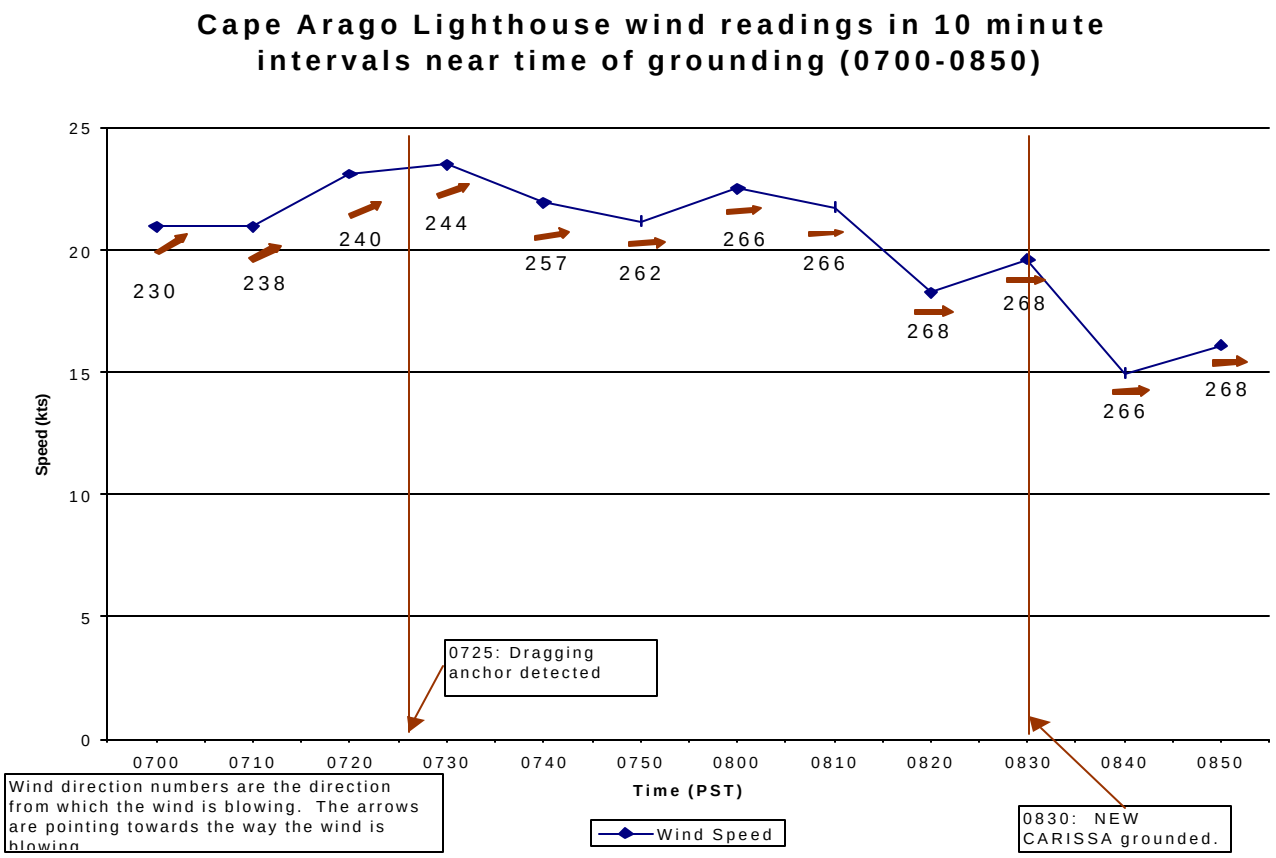
or comment, by the USCG Point Reyes, California Communications Station. Vessels can receive this information either by NAVTEX or Weather Fax. The USCG Group Coos Bay Communications Center relays the National Weather Service weather messages as an aid to the maritime industry. This information is relayed to marine traffic on channels 10, 11 and 13 VHF-FM radio as soon as the Coast Guard receives it.

Table 1 : Weather Predictions Transmitted to Vessels (as Summarized by the NWS for the hearing.)

1430 PST Wed 03 Feb Coastal Marine Forecast: Gale warning and heavy surf advisory in effect for the Coos Bay area. Winds forecasted from the southwest at 35 knots, diminishing to west winds of 25 knots by morning. Combined seas forecast to increase to 22 feet.[4]
2030 PST Wed 03 Feb Coastal Marine Forecast: Gale warning and heavy surf advisory in effect for the Coos Bay area. Winds forecast to be from the southwest at 35 knots and combined seas increasing to 22 feet after midnight.
0115 PST Thurs 04 Feb HEAVY SURF ADVISORY: "A heavy surf is expected to develop this morning along the coast of southern Oregon and the extreme northern California coast. Strong onshore winds behind a cold front have generated large offshore swells in excess of 30 feet. This will generate surf along the coast in the 20-25 foot range. The high surf is expected to last through today. Those near the surf zone should exercise extreme caution. Exposed structures such as jetties can be inundated by high surf. Harbor entrances and river bars will also be hazardous."
0230 PST Thurs 04 Feb Coastal Marine Forecast: Gale warning and heavy surf advisory remained in effect for the Coos Bay area. Winds forecast from the southwest at 35 knots, diminishing to west winds of 15 knots by the afternoon. Seas forecast in separate components, wind waves of 5 feet diminishing to 2 feet during the afternoon, and a 16-foot swell coming from the west. These are equivalent to a combined sea of 17 feet.
0830 PST Thurs 04 Feb Coastal Marine Forecast: Gale warning and heavy surf advisory still in effect for the Coos Bay area. Winds forecast from the southwest at 35 knots, diminishing to west winds of 15 knots in the afternoon. Seas forecast in separate components: wind waves 5 feet with westerly swell of 22 feet (the combined sea 23 feet).

[4]Gale Forecasts apply until a new one is issued; for instance, the 1430 PST Wednesday 3 February prediction applied until the 2030 PST forecast was issued.


Cape Arago Lighthouse Wind Readings
Times are from 1600, Feb 3 through 1000 Feb 4, 1999
000
42
39
34
34
31
30
29
25
28
26
25
24
23
21
18
16
11
9
180
210
220
200
244
266
266
278
1900: NEW CARISSA Anchors
1600
1900
2200
0100
0400
0500
0600
0900
1000
Time (PST)
Speed (kts)
0
5
10
15
20
25
30
35
40
45
Wind direction numbers are the direction from which the wind is blowing. The arrows are pointing towards the way the wind is blowing.
Wind Speed
Gusts


Cape Arago Lighthouse wind readings in 10 minute intervals near time of grounding (0700-0850)
230
238
240
244
257
262
266
266
268
268
266
268
0725: Dragging anchor detected
0830: NEW CARISSA grounded.
0700
0710
0720
0730
0740
0750
0800
0810
0820
0830
0840
0850
Time (PST)
Speed (kts)
0
5
10
15
20
25
Wind direction numbers are the direction from which the wind is blowing. The arrows are pointing towards the way the wind is blowing
Wind Speed

b. Summation of Weather

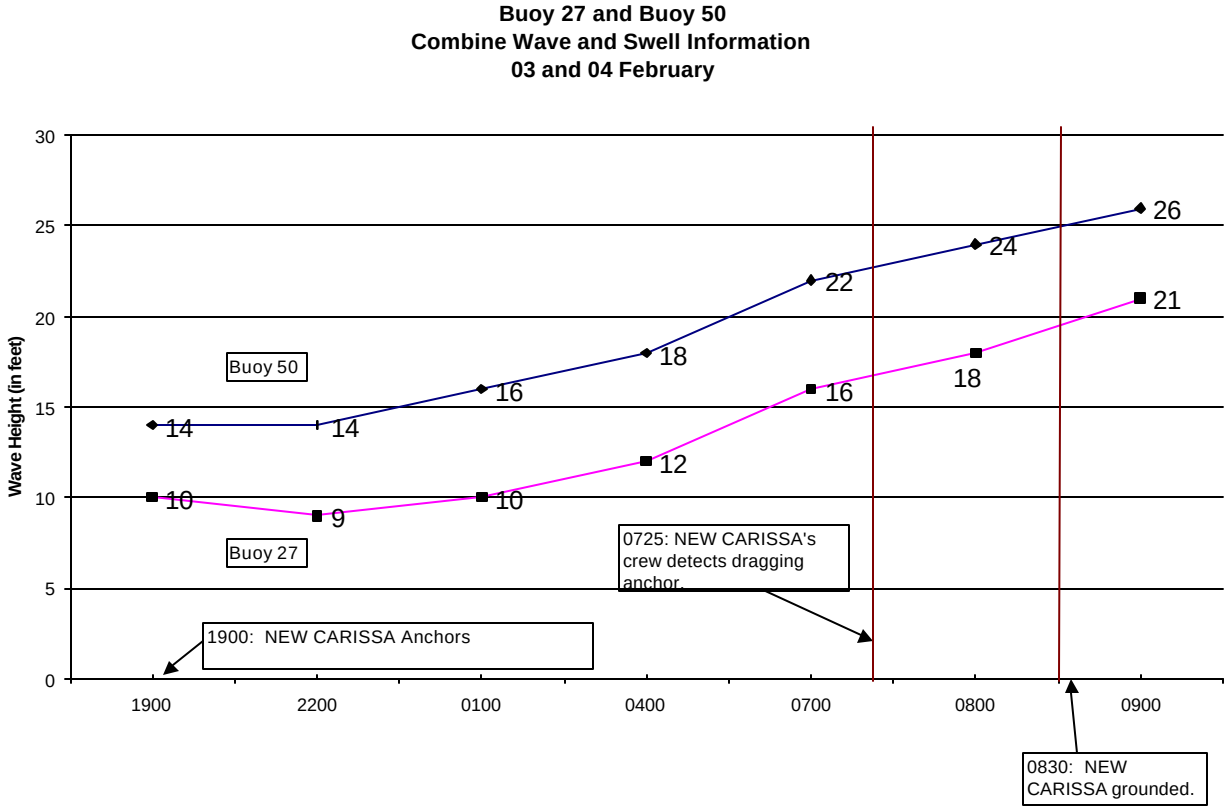
Coos Bay experienced the effect of a low-pressure system north of the area on Wednesday, 3 February. The prevailing winds blew from a low pressure system located southwest of Coos Bay into a northern low. This produced south-southwesterly winds. The frontal system eventually moved onshore that evening as a secondary trough (and area of lower pressure) approached the coast.

At 1900 Wednesday evening, the Cape Arago Light station recorded winds from 210T at a sustained speed of 31 knots, with a maximum gust up to 39 knots. Three hours later there was not much change with winds coming from 220T at a sustained speed of 30 knots, gusting to 34. Thereafter the winds slowly decreased to 21 knots. Around 0500, when the secondary trough began to pass through the area, there was a slight increase in wind speed in the range of 22 to 24 knots with the wind direction coming more from the west.

On the morning of 4 February, as predicted by the weather service, wind speeds were substantially less than those observed the previous evening; however, the west-northwesterly swells were much greater.

c. Wave and Swell Conditions

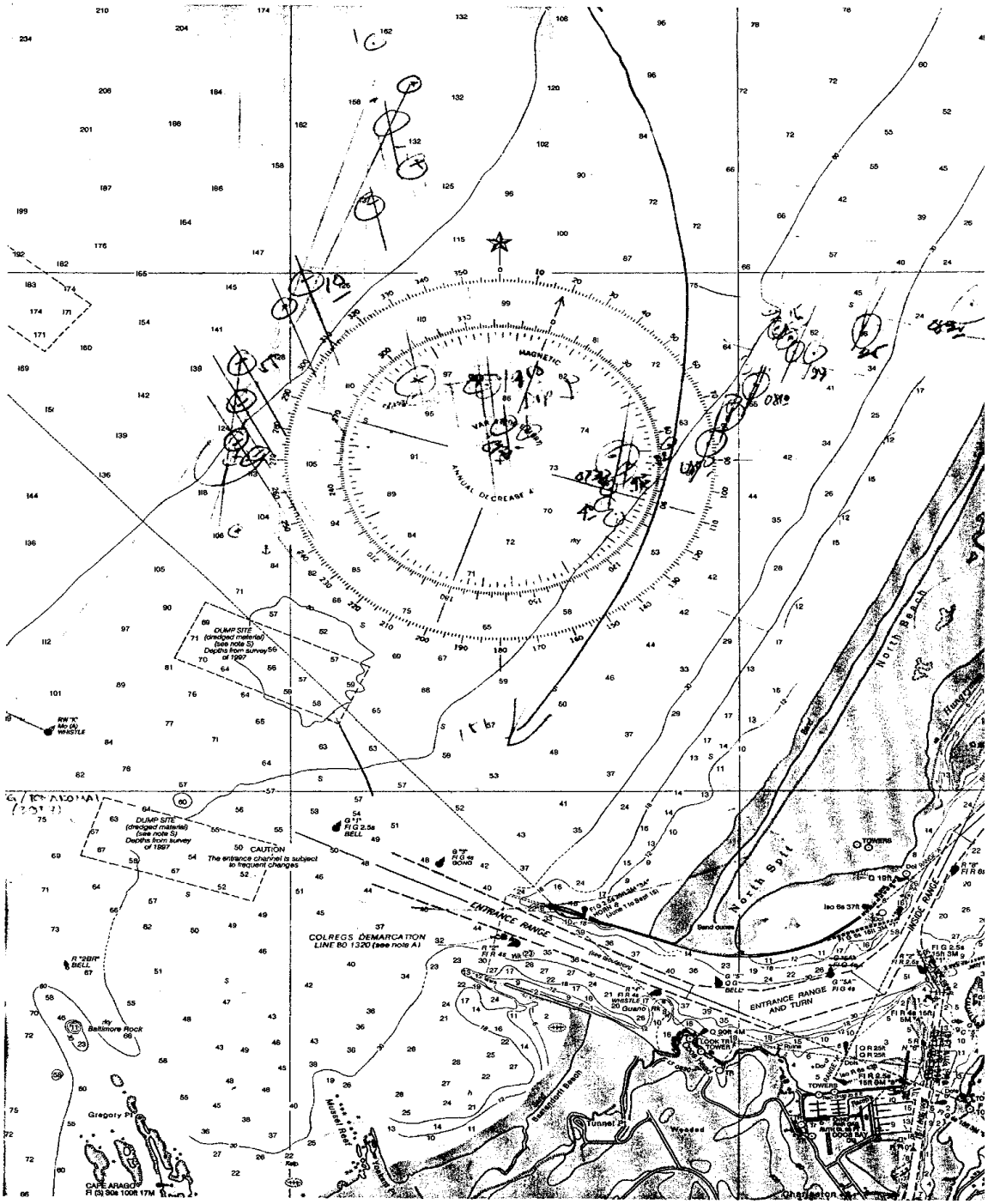
Sea state is best determined by extrapolating the available data recorded by the offshore weather buoys. The two closest buoys reporting seas are buoy 50 offshore of Newport, Oregon and buoy 27 offshore of St. Georges, California. These buoys are approximately 100 miles north and south of Coos Bay, respectively. There is no means for determining wave height from the Cape Arago, Oregon station.



On 4 February 1999, buoy 50 measured seas of 24 feet[5] at 0800 PST. One hour later the seas were recorded as 26 feet. South of the area, at buoy 27, seas were recorded as 18.3 feet at 0800 PST, and 21 feet at 0900 PST. The seas in the Coos Bay area were somewhere between these readings, most probably, in the 20 foot range around the time the ship detected its anchor dragging (0730 PST). The swells continued to increase until about 0900 PST. The direction of the swells was from the west-northwest on 4 February as testified to by the Coast Guard Watch Stander in the Coos Bay tower.

[5] Sea state is measured in feet. The oceanographic research buoys read the total vertical movement of the buoy to record the sea height. This is measured from the height of the wave top to the base of the wave trough. The data points shown are the highest 1/3 of the readings sampled during a 20 minute period.

APPENDIX 2: Reproduction of Chart 18587 taken off the NEW CARISSA



The above graphic is a scanned image of the chart entered into evidence at the hearing representing the NEW CARISSA's charted position from anchoring until grounding.

APPENDIX 3: Parties in Interest

Coos Bay Pilot Association
Represented by: Mr. Kevin Q. Davis
Port of Portland Building, Suite 950
700 NE Multnomah
Portland, Oregon, 97232

International Shipping, Inc.
Represented by: Mr. Kent Roberts
Schwabe, Williams, & Wyatt
121 SW Fifth Avenue, Suite 1800
Portland, Oregon 97201

Captain Benjamin Morgado
Represented by: Ms. Janet Lee Hoffman
1000 SW Broadway, Suite 1500
Portland, Oregon 97205

Owner & Operator of the M/V NEW CARISSA
Represented by: Mr. Bob Sanders
Wood, Tatum, Sanders, & Murphy
1001 SW Fifth Avenue, Suite 1300
Portland, Oregon 97204

Representing the Government of Panama
Captain Joe Fox, USCG Retired
Fox Associates, Inc.
1133 Silent Harbor Drive
Mt. Pleasant, SC 29464

APPENDIX 4: Information from Coast Pilot, Number 7

Excerpt discussing the Coos Bay Harbor, Approach, and Anchorage areas:[6]

> "Coos Bay, Oregon, located 33 miles north of Cape Blanco, Oregon, is used as a harbor of refuge and can be entered at any time except in extreme weather. Coos Bay is one of the most important harbors between San Francisco and the Columbia River, and one of the largest forest products ports in the world. Principal foreign exports are logs, woodshops, lumber, plywood, paper, and paperboard. The coastwise trade consists mainly of sand and gravel, lumber, plywood and veneer, gasoline and distillate fuel oils.
>
> "A Board of Port Commissioners and a port manager controls the Port of Coos Bay. Harbor regulations are prescribed by the Port Commissioners and enforced by the Port Manager. There are no port, state or federal regulations regarding anchoring outside the Coos Bay Channel Entrance.
>
> "Coos Head, Umpqua River Light, and Cape Arago Light are good guides to the entrance. Jetties protect the entrance to the bay. A light with seasonal fog signals mark the north jetty. A lighted whistle buoy is 1.8 mile west north-west of the entrance.
>
> "There is usually a current sweeping either N or S just off the jetties, and this current should be guarded against. The S current is often encountered during the summer. With strong S winds during the winter, the current sometimes sets to the N. Approaching from any direction in thick weather, great caution is essential. The currents are variable and uncertain.
>
> "Bar closure is somewhat seasonal from November until April. During this time they get the heaviest westerly swell (SW or NW). It is rare to have a less than 8 foot swell.

[6] Information regarding the Coos Bay location and attributes are taken from the U.S Coast Pilot 7, 31st Edition, Pages 158, 160, 276 & 277.

> "Anchorage for deep-draft vessels with good holding ground, sand bottom, can be had about 1 mile NE of Coos Bay Lighted Whistle Buoy K (43-22.2N, 124-23.0W)."

The Coast Pilot specifically advises that in a bar area, sea conditions can change rapidly and without warning. The Coast Pilot also advises on page 160 that, when a storm moves close or through these northern waters, weather changes rapidly. Predominantly, the weather center is preceded by a strong southeast to southwest flow that may reach gale force (gales occur on about 3 to 5 days per winter month) and may whip seas up to 20 feet (6.1m) or more. After the center passes, winds normally veer to the west through the north and remain strong for a while.

The mean range of tide at Coos Bay is 5.6 feet and the diurnal range of tide is 7.3 feet. A range of about 12 feet may occur at the time of maximum tides. Tidal current observations in the entrance to Coos Bay indicated a velocity of about 2 knots. Captain Sweet testified that local currents are wind generated and set predominantly northwesterly, and for the 3-4 February 1999 period, it most likely would be setting to the north.

APPENDIX 5: Pilotage Issues and Regulations

The Coos Bay Pilot Association is responsible for providing pilotage services to foreign vessels entering Coos Bay. There are four state and federally licensed Pilots currently working in Coos Bay. The Coast Pilot does not describe federal or state Pilotage laws for the Oregon coast nor does it specify when or where a vessel must take aboard a Pilot (e.g. at a specific location or if proceeding to anchor offshore). The Coast Pilot and the testimony of two Coos Bay Pilots agree that Pilots usually board vessels about 1 mile NW of Coos Bay Approach Lighted Whistle Buoy K.

The pilot boats monitor VHF-FM channel 16 and use channel 12 as a working frequency. These channels are not under constant monitoring by the Pilots. The Coast Pilot provides information on how to contact a Pilot if necessary via telephone.

An average of 8-10 vessels per month require Pilot services at Coos Bay.

The normal transit time from the time a vessel picks up a pilot to berth is between 2 ½to 4 hours depending on the sea and traffic conditions.

a. Pilotage Regulations

The primary U.S. law regulating the NEW CARISSA and the requirement for a pilot is found in 46 USC 8501. This law delegates authority to the states to regulate foreign vessel pilotage.

Oregon Revised Statute 776.025 is the primary state pilotage law that affected the NEW CARISSA. Section 776.025 states:

> *Description of bar and river pilotage grounds.*
> Except as may be established by the Oregon Board of Maritime Pilots under ORS 776.115 (3), bar and river pilotage grounds shall be as follows:
>
> ***

> (3) The Coos Bay bar pilotage ground extends from the head of navigation on Coos Bay and its tributaries to the open sea in at least 30 fathoms of water.

Oregon Revised Statute 776.025(3) referred above states:

> *Powers and Duties of Board.*
> The Oregon Board of Maritime Pilots shall:
> ***
> (3) Establish and fix the boundaries of the pilotage grounds not described in ORS 776.025.

The Pilots testified that to their knowledge, the Oregon law has never been enforced. However, if it were to be enforced, the State Board of Maritime Pilots would be the ruling agency. To their knowledge this law has not been challenged.

There is no written policy or definition of the Coos Bay pilotage grounds that are referred to in ORS 776.025 or .115(3). The Pilots testified that they interpret the pilotage grounds, which by statute go out to 30 fathoms (180 feet), as an arc north and south of the bar entrance. The size of this arc is approximately 2.9 miles seaward, north and south of the end of the north jetty. This information is not published nor was it made available to the NEW CARISSA's Master. Nevertheless, the Oregon State Attorney General's Office has determined that the Coos Bay Pilots Association's definition is not enforceable as law.

Generally, the pilots board vessels approximately one mile outside the sea buoy and sometimes further out depending on the sea conditions. When the arriving vessel gets close enough for radio communications and are about 2 hours away from the agreed boarding time, the pilots will contact the vessel on VHF-FM radio. One Pilot testified that vessels are only brought into Coos Bay during daylight hours in the winter because of the prevailing heavy weather conditions found offshore and on the bar.

b. Pilot's Advice to Vessels

Coos Bay Pilots use local knowledge, experience, and their bar evaluation to determine if it is safe for deep draft vessels to cross the bar safely. The duty Pilot conducts a bar evaluation prior to advising a deep draft vessel.

The Pilots communicate the bar conditions and their intentions directly to the vessel via VHF-FM radio. After communicating the conditions to the vessel and determining that it would be unsafe to bring the vessel across the bar, the Pilot advises the vessel as to a new time when the bar conditions will be reevaluated. Generally, no additional information is requested or given. It is up to each Master to decide whether their vessel will drift offshore, steam in a circle offshore, or anchor. The Pilots will only comment on anchoring or provide their advice if they are specifically asked. In such a circumstance, the Pilots testified they would recommend that vessels stay offshore.

One Pilot testified that if he could not board, he might tell the ship to stay offshore and stay about 3NM from the sea buoy. In any case, he would expect the vessel to steam offshore until the he gets back to them after conditions improved.

The Pilots emphasized they did not know the NEW CARISSA was going to anchor. Moreover, they never instruct vessels to anchor and only mention anchoring issues when directly asked by the vessel. The Pilots further testified they are only advisors to the Master when aboard and that the Master may overrule any helm command they issue.

When not aboard the vessel, Pilots are very reluctant to give any advice since it may be misconstrued by the crew as direction from the Pilot. If a casualty results while the Pilot is not on the vessel and the Pilot had instructed the vessel to remain offshore, the Pilots fear they may be held accountable. Along the same lines, the Pilots would not offer navigation advice unless specifically asked since they feel the Master knows the capability of his ship and understands how it will react with regard to environmental conditions. Finally, the Pilots testified that there is no safe anchorage between October and May and that vessels should drift or steam offshore during these months.

c. Pilot's Knowledge of the Offshore Anchorage

The Pilots testified that they have anchored in the area in which the NEW CARISSA anchored, north of the Coos Bay entrance in good weather for short periods of time to wait for fog in the channel to clear.

The Pilots testified that the area near the Army Corps of Engineers dredge spoils dumpsite marked on the chart may be subject to steeper, sharper, and breaking waves. Nevertheless, these breakers should not affect the area north of the dumpsite when a NW swell is present.

The Pilots testified it is not good practice, nor safe to board a vessel anchored offshore in the winter because it is difficult to obtain a safe lee from the prevailing heavy sea conditions. To artificially calm the conditions, the Pilots instruct anchored vessels to get underway to meet the pilot boat

One Pilot, Captain Sweet, testified that if he were to anchor in the area north of the Coos Bay Bar, he would use the area approximately 1.5 NM northeast of the K buoy. When expecting to remain at anchor for only a short time, he will typically use 3 ½ to 4 shots of chain paid out from the vessel. If the vessel must remain at anchor for longer periods he would pay out 7 to 8 shots. Once anchored, he would immediately obtain a GPS position for a reference. To monitor this position, he would use the radar bearing and range off the north jetty if there is not a lot of sea clutter on the radar.

Again, Captain Sweet testified he would not anchor a vessel in that area at any time during the winter regardless of the weather conditions because storms often "come up" within 24 hours. He also testified that the Coos Bay Pilots have an unwritten policy not to recommend vessels anchor offshore Coos Bay in winter even though the area has excellent holding bottom. Although the Coast Pilot describes the anchorage area accurately, due regard should be had by persons using the area for "anchoring in the open sea."

APPENDIX 6: Negligence versus Act of God (*Vis Major*)

Blacks Law Dictionary defines a negligent offense as: "One which ensues from the defective discharge of a duty, which defect could have been avoided by the exercise of that care which is usual, under similar circumstances, with prudent persons of the same class."

Farwell's Rules of the Nautical Road, Sixth Edition, examines how casualties have been compared, examined, and determined to be *vis major*. It is important to address this issue in light of the Master's desire to invoke his Fifth Amendment Rights.

Page 326, Forehandedness is Essential: The scope of good seamanship is wide, but its practice has one underlying quality – that of forehandedness, or of thinking ahead.

> Since weather information was available to the NEW CARISSA and the prevalent conditions as testified to by the crew indicate the vessel was in a gale prior to anchoring on 3 February 1999, it appears the Master did not properly use or evaluate all the information available to him prior to anchoring. The master did not ask the Coos Bay pilots about local anchor grounds and the Second Officer failed to use the Coast Pilot to obtain information about local conditions or anchorages.

Page 372, Inevitable Accident: Vis Major" has been defined as an irresistible, natural cause that cannot be guarded against by the ordinary human skill and prudence. An injury caused by vis major is equivalent to an act of God.

> As noted previously, the wind and sea would not have forced the NEW CARISSA ashore had the master not anchored in a gale, on a lee shore, during the winter, in an unprotected part of the Pacific Ocean. This grounding may have also been avoided had the Master, once anchored, payed out additional chain or dropped his second anchor to ensure the vessel would not drag. The Chief Officer testified that, in his experience, all mariners must be aware of unsuspected weather occurrences when operating vessels.

Page 373, Other Cases of Vis Major at Anchor: When vessels at anchor fail to hold position and are brought into collision with other vessels through dragging, it is very unusual for the courts to excuse them on the plea of inevitable accident. It is apparent from the decisions that in such cases a heavy burden is put upon the offending vessel to show that she was properly anchored.

Without an examination of the Master's decision making, it is impossible to fully understand:

- Why he chose to anchor.
- What was his rationale for the anchor procedures used.
- Why weren't additional measures taken to ensure the vessel did not drag, i.e. laying out a longer scope of chain or letting go a second anchor.
- Why, once the vessel began to drag its anchor, did he chose to attempt to get underway rather than veer more chain or drop the second anchor.

In the collision of the BRAGDO and the BRITISH ISLES the court cited Knights Seamanship:
It is common rule to give, under ordinary circumstances, a length of cable equal to seven times the depth of water. This perhaps enough for a ship riding steadily and without any great tension on her cable, but it should be promptly increased if, for any reason, she begins to sheer about or jump, for it is always easier to prevent an anchor from dragging than to make it hold after it has begun to drag. (The British Isles (CCA 1920(262 F 318 (emphasis added)

The Master chose to lay out 7 shots of chain (90 x 7 = 630 feet) in water that was about 100 feet, a 6 to 1 ratio. Although the ship anchored during gale conditions and rising swells were forecast, the Master apparently did not take any precautionary measures. Essentially, he underestimated the strength of the rising sea. And it may be presumed that because the ship was due to get underway at about the same time the Master was notified of the dragging anchor, he chose not to veer more chain out or to drop the ship's second anchor.

Page 374, Three barges anchored off Newport News were dragged for more than an hour under the pressure of drifting ice, before striking and damaging a vessel moored to a pier. Two barges were held at fault for failure to drop a second anchor, while the third barge, which had lost her second anchor was exonerated. (The HERM (CCA 1920) 267 F 373)

One barge dragged into another and was held at fault when the evidence showed that although she was forewarned as to the storm, she had only one anchor out until after she had begun to drag. (The DJERISSA (CCA 1920) 267 F 115)

Page 376,: The mere presence of vis major does not excuse a vessel if she has been negligent in bringing herself into a critical situation.

Page 378, Inevitable accident cannot be maintained as a defense unless it be shown that the master acted reasonably, that he did everything which an experienced mariner could do, and that the collision ensued in spite of ordinary caution and his exertions. (The Southern Ry. Co. v. U.S. (1910) 45 Ct. Cl.322

A steamship that was very light was being docked in Mobile Harbor by two tugs whose movement were directed from her bridge. She struck and damaged another vessel moored at a pier, and the court found that while a wind squall was undoubtedly the proximate cause of the collision, the weather conditions were well known, storm warnings had been hoisted, and the landing should not have been attempted. In a collision case defense of inevitable accident will not avail unless the vessel was free from fault, and such defense cannot be maintained if a vessel voluntarily puts herself in a situation where she received the effect of natural forces, the result of which should have been foreseen and might reasonable been anticipated.

> As previously noted, had the Master the forethought to take the safest route, that of weathering the gale and high seas offshore until the pilots were ready to board, the vessel would not have gone aground.

Page 384, Summary: Inevitable accident has been defined as something that human skill and foresight could not, in the exercise of ordinary prudence, have provided against.